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### 61 [Power grid analysis and optimization: Power network analysis using an adaptive algebraic multigrid approach](#)



Zhengyong Zhu, Bo Yao, Chung-Kuan Cheng

June 2003 **Proceedings of the 40th conference on Design automation****Publisher:** ACM PressFull text available: [pdf\(146.48 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we introduce an efficient analysis method for the power network of general topology. The new approach is based on algebraic multigrid (AMG) method that can avoid the slow convergence of basic iterative methods. An innovative adaptive coarsening and error-smoothing scheme is employed to further speed up the performance, taking advantage of the spatial variation of power supply noise. Experimental results show that our method is more than 100 times faster than SPICE3.

**Keywords:** adaptive analysis, algebraic multigrid method, circuit simulation, power distribution network

### 62 [Adaptive smooth scattered-data approximation for large-scale terrain visualization](#)

Martin Bertram, Xavier Tricoche, Hans Hagen

May 2003 **Proceedings of the symposium on Data visualisation 2003 VISSYM '03****Publisher:** Eurographics AssociationFull text available: [pdf\(3.75 MB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#)

We present a fast method that adaptively approximates large-scale functional scattered data sets with hierarchical B-splines. The scheme is memory efficient, easy to implement and produces smooth surfaces. It combines adaptive clustering based on quadrees with piecewise polynomial least squares approximations. The resulting surface components are locally approximated by a smooth B-spline surface obtained by knot removal. Residuals are computed with respect to this surface approximation, determi ...

### 63 [Post-convolved splatting](#)

Neophytos Neophytou, Klaus Mueller

May 2003 **Proceedings of the symposium on Data visualisation 2003 VISSYM '03****Publisher:** Eurographics AssociationFull text available: [pdf\(2.18 MB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

One of the most expensive operations in volume rendering is the interpolation of samples in volume space. The number of samples, in turn, depends on the resolution of the final image. Hence, viewing the volume at high magnification will incur heavy computation. In this paper, we explore an approach that limits the number of samples to the resolution of the volume, independent of the magnification factor, using a cheap post-convolution

process on the interpolated samples to generate the missing s ...

#### 64 Color gamut matching for tiled display walls



Grant Wallace, Han Chen, Kai Li

May 2003 **Proceedings of the workshop on Virtual environments 2003 EGVE '03**

**Publisher:** ACM Press

Full text available: pdf(678.72 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citings](#), [index terms](#)

This paper presents a non-parametric full-gamut color matching algorithm. Color matching is important for the seamless appearance of tiled displays. In particular we address the case where the tiled display is composed of different types of projectors or DLP projectors with white enhancement. White enhancement produces a non-additive color space that is difficult to model. We perform our calibration using an inexpensive colorimeter as opposed to a highly accurate spectroradiometer. Our results s ...

#### 65 Session 4: video processing and transformation: Painting with looks: photographic images from video using quantimetric processing



Steve Mann, Corey Manders, James Fung

December 2002 **Proceedings of the tenth ACM international conference on Multimedia**

**Publisher:** ACM Press

Full text available: pdf(861.14 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citings](#)

When we ask the fundamental question "What does a camera measure?", we arrive at the concept of quantimetric imaging, which uses a new quantimetric unit,  $q$ , characteristic of a particular camera (e.g. each kind of camera defines its own quantimetric unit  $q$  based on its spectral response, etc.). Fluctuations in interframe exposures, along a sequence of images, give rise to a *comparametric* relationship between successive pairs of images. This allows us to estimate the response ...

**Keywords:** comparametric equations, comparametrics, image processing, multiple exposures, video

#### 66 A scalable parallel fast multipole method for analysis of scattering from perfect electrically conducting surfaces

Bhanu Hariharan, Srinivas Aluru, Balasubramaniam Shanker

November 2002 **Proceedings of the 2002 ACM/IEEE conference on Supercomputing**

**Publisher:** IEEE Computer Society Press

Full text available: pdf(193.51 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we develop a parallel Fast Multipole Method (FMM) based solution for computing the scattered electromagnetic fields from a Perfect Electrically Conducting (PEC) surface. The main contributions of this work are the development of parallel algorithms with the following characteristics: 1) provably efficient worst-case run-time irrespective of the shape of the scatterer, 2) communication-efficiency, and 3) guaranteed load balancing within a small constant factor. We have developed a ...

#### 67 Multi-resolution representations: Interactive visualization of unstructured grids using hierarchical 3D textures

Joshua Leven, Jason Corso, Jonathan Cohen, Subodh Kumar

October 2002 **Proceedings of the 2002 IEEE symposium on Volume visualization and graphics**

**Publisher:** IEEE Press

Full text available: pdf(2.83 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present a system for interactively rendering large, unstructured grids. Our approach is to voxelize the grid into a 3D voxel octree, and then to render the data using hierarchical, 3D texture mapping. This approach leverages the current 3D texture mapping PC hardware for the problem of unstructured grid rendering. We specialize the 3D texture

octree to the task of rendering unstructured grids through a novel *pad and stencil* algorithm, which distinguishes between data and non-data voxel ...

68 Session P6: level sets and isovalues: Level set segmentation from multiple non-uniform volume datasets

Ken Museth, David E. Breen, Leonid Zhukov, Ross T. Whitaker

October 2002 **Proceedings of the conference on Visualization '02**

**Publisher:** IEEE Computer Society

Full text available:  pdf(6.77 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Typically 3-D MR and CT scans have a relatively high resolution in the scanning X - Y plane, but much lower resolution in the axial Z direction. This non-uniform sampling of an object can miss small or thin structures. One way to address this problem is to scan the same object from multiple directions. In this paper we describe a method for deforming a level set model using velocity information derived from multiple volume datasets with non-uniform resolution in order to produce a ...

**Keywords:** 3D reconstruction, level set models, segmentation, visualization

69 Session P1: medical visualization: Direct surface extraction from 3D freehand ultrasound images

Youwei Zhang, Robert Rohling, Dinesh K. Pai

October 2002 **Proceedings of the conference on Visualization '02**

**Publisher:** IEEE Computer Society

Full text available:  pdf(1.10 MB) Additional Information: [full citation](#), [abstract](#), [references](#)

This paper presents a new technique for the extraction of surfaces from 3D ultrasound data. Surface extraction from ultrasound data is challenging for a number of reasons including noise and artifacts in the images and non-uniform data sampling. A method is proposed to fit an approximating radial basis function to the group of data samples. An explicit surface is then obtained by iso-surfacing the function. In most previous 3D ultrasound research, a pre-processing step is taken to interpolate th ...


**Keywords:** 3D freehand ultrasound, direct surface extraction, isosurface, radial basis functions, ultrasound, unstructured data

70 Direct Surface Extraction from 3D Freehand Ultrasound Images

Youwei Zhang, Robert Rohling, Dinesh K. Pai

October 2002 **Proceedings of the conference on Visualization '02**

**Publisher:** IEEE Computer Society

Full text available:  Publisher Site Additional Information: [full citation](#), [abstract](#)

This paper presents a new technique for the extraction of surfaces from 3D ultrasound data. Surface extraction from ultrasound data is challenging for a number of reasons including noise and artifacts in the images and non-uniform data sampling. A method is proposed to fit an approximating radial basis function to the group of data samples. An explicit surface is then obtained by iso-surfacing the function. In most previous 3D ultrasound research, a pre-processing step is taken to interpolate the data ...

**Keywords:** Radial Basis Functions, Ultrasound, Isosurface, 3D Freehand Ultrasound, Direct Surface Extraction, Unstructured data

71 Interactive global illumination: Interactive global illumination using selective photon tracing

Kirill Dmitriev, Stefan Brabec, Karol Myszkowski, Hans-Peter Seidel

July 2002 **Proceedings of the 13th Eurographics workshop on Rendering EGRW '02**


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